

ABSTRACT

A catalyst for hydrotreatment of gas oil, comprising from 0.1 to 10% by weight platinum, from 0.1 to 20% by weight palladium, and from 0.05 to 1.2% by weight halogen in terms of the respective elements based on the catalyst in a support comprising an inorganic oxide containing an alumina, wherein the alumina comprises a crystalline alumina having a crystallite diameter of from 20 to 40 Å; a method for hydrotreating gas oil, comprising carrying out a catalytic reaction of a gas oil fraction containing an aromatic compound in the presence of the catalyst according to any one of claims 1 to 5 at a hydrogen partial pressure of from 3 to 8 MPa, a temperature of from 200 to 370°C, a liquid hourly space velocity of from 0.3 to 5.0 h⁻¹, and a hydrogen/oil ratio of from 100 to 1,000 L/L; and a method for hydrotreating gas oil, comprising: carrying out, as a first desulfurization step, a catalytic reaction of straight-run gas oil having a boiling point of from 160 to 400°C or blend oil comprising the straight-run gas oil and at least one other hydrocarbon oil at a hydrogen partial pressure of from 3 to 7 MPa, a temperature of from 200 to 400°C, a liquid hourly space velocity of from 0.5 to 5.0 h⁻¹, and a hydrogen/oil ratio

of from 100 to 1,000 L/L in the presence of a catalyst comprising from 10 to 25% by weight at least one metal selected from the Group 6a of the periodic table and from 0.1 to 6% by weight at least one metal selected from the Group 8 of the periodic table in terms of the respective oxides based on the catalyst in a support comprising an inorganic oxide to thereby regulate the oil so as to have a sulfur-containing compound content of 0.2% by weight or lower after the step; and then carrying out, as a second desulfurization step, a catalytic reaction of the oil after the first desulfurization step at a hydrogen partial pressure of from 3 to 8 MPa, a temperature of from 150 to 370°C, and a liquid hourly space velocity of from 0.3 to 5.0 h⁻¹ in the presence of a catalyst comprising from 0.1 to 10% by weight platinum, from 0.1 to 20% by weight palladium, and from 0.05 to 1.2% by weight halogen in terms of the respective elements based on the catalyst in a support comprising an inorganic oxide containing an alumina.